## REMARKS

Claims 1–20 are pending in the present application.

Claims 1-2, 7-9, 14-16 and 18-20 have been rejected.

Claims 3-6, 10-13 and 17 have been objected to.

No claims have been allowed.

Reconsideration of the claims is respectfully requested.

### 1. Amendment to the Specification

Page 10, Lines 6-21, of the specification have been amended to correct a typographical error. No new matter has been added to the specification as a result of the amended specification.

### 2. 35 U.S.C. § 103(a) (Obviousness)

In Sections 1 and 2 of the February 21, 2003 Office Action, the Examiner rejected Claims 1–2, 7–9, 14–20 and 18-20 under 35 U.S.C. § 103(a) as being obvious in view of United States Patent No. 4,560,951 to *Fütterer*. This rejection is respectfully traversed.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. MPEP § 2142; *In*

*re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142.

Independent Claims 1, 8 and 15 of the Application each recite negating or "tuning out" parasitic or stray capacitances within a differential mode SAW resonator, allowing a series resonant circuit to be formed by the SAW resonator and a variable tuning capacitor coupled to a port of the SAW resonator. Additionally, by coupling the differential mode SAW resonator to a differential amplifier, a differential oscillator providing common mode rejection (and hence substantial noise immunity) is formed. Such features are not shown or suggested in the cited reference, nor apparent to those skilled in the art. Any assertion within the Office Action that such a structure or process is well-known in the art is respectfully traversed.

Independent Claims 1, 8 and 15 each recite at least one inductance coupled to one or more inputs or outputs of a differential mode SAW resonator, connected and sized to approximately tune out a stray capacitance seen across the inputs or outputs within an equivalent circuit for the SAW resonator at a selected frequency. In the present invention, a differential mode SAW resonator is tuned by coupling to the reactive (inductive and capacitive) portion of the equivalent circuit for the SAW resonator with an external variable reactance in a manner forming a single resonant circuit, in which changes to the variable reactance alter the resonant frequency of the combined resonant circuit. This allows greater tuning range to be achieved, and avoids secondary effects which must be suppressed. Access to the equivalent circuit is gained by negating or "tuning out" parasitic or stray capacitances across the port, which would otherwise prevent the external reactance from

forming a single resonant circuit with the SAW resonator, but would instead form two resonant circuits.

Such a feature is not shown or suggested by the cited reference. *Fütterer* teaches first and second balancing inductances L4 and L5 across the inputs and the outputs, respectively, of a SAW device. However, *Fütterer* only teaches that such inductances are provided to offset the capacitive component of the impedance seen at the input and output for impedance-matching the SAW connections to the amplifier and the 3 dB coupler:

> The output terminal d of the 3dB coupler is connected to one input terminal of a surface-wave transmission line SAW which is intended for an oscillator frequency of 167 MHz. The other input terminal is connected to the reference potential; the first and second input terminals being connected through a resistance Z, with a value corresponding to the characteristics of the 3dB coupler or impedance of about 75 ohms, and through a first balancing inductance L4. Likewise, the two output terminals of the surface-wave transmission line are connected with one another through a second balancing inductance L5. The need for these balancing inductances arises from the strongly capacitive input and output impedances of the surface-wave transmission line. The output terminals of the surface-wave transmission line, at which the output signal is in push-pull, are connected with the base terminals of the first and second transistors T1, T2 of the amplifier V. Through the construction selected, both the amplifier and the 3dB coupler are match-terminated.

(*Fütterer*, Column 4, Lines 48–67). However, the capacitive component of the impedance seen at the input and output ports of the SAW device in *Fütterer* will not be limited to the parasitic or stray capacitances, but will also be based in part on the reactance of the SAW device's equivalent circuit within the selected operating frequency range. Inductances L4 and L5 will not inherently tune out the stray capacitances at the selected operating frequency as recited in the claims. In order to gain

access to the equivalent circuit at a desired frequency, the parasitic or stray capacitance must be negated or tuned out for that frequency. Too small of an inductance will result in stray capacitance remaining. Too large of an inductance will create an inductive barrier to access to the equivalent circuit in place of the capacitive barrier created by the stray capacitance. Moreover, at different frequencies, the inductance required will differ. The inductance must therefore be selected based on the stray capacitance at the desired frequency. *Fütterer* does not mention stray or parasitic capacitance, or tuning such capacitance out at a desired frequency.

Independent Claims 1, 8 and 15 also each recite a variable tuning capacitance connected in series with the one or more inputs or outputs of the SAW resonator a resonant frequency of the combination SAW resonator/tuning capacitance circuit. Such a feature is not shown or suggested by the cited reference. Capacitance diodes D1 and D2 depicted in Figure 2 of *Fütterer* are simply switching elements having a "hyper-abrupt characteristic" (i.e., sharp turn-on/turn-off switching), and are not shown or suggested to have a variable capacitance that may be altered to adapt a resonant frequency of the overall circuit. (*Fütterer*, Column 4, Lines 6–15).

The Examiner stated that "The reference by Futterer discloses a SAW resonator (see figure 2, and summary) which shows a SAWR with two port differential construct. Note the inductors across the two port circuit (L5, L4), the inductors being designed/specified as balanced inductances, also, a SAW resonator with varactors (D2,D1), albeit hyperabrupt types. The inductors are coupled to ground. The method steps being inherent." (February 21, 2003 Office Action, Page 2).

The Applicant respectfully traverses the Examiner's characterization of the subject matter of *Fütterer*. First, both of the inductors (L4, L5) are not coupled to ground. As shown in Figure 2 of *Fütterer*, inductor L5 is not coupled directly to ground but is coupled to a fifth resistance R5 of the first emitter-coupled differential amplifier in amplifier V. Second, there is no showing or suggestion that the structure that the Examiner called a "SAW resonator with varactors (D2,D1)" is capable of tuning out parasitic or stray capacitances in the SAW device. The capacitance diodes D1 and D2 are part of a control voltage device that provides a control voltage "so that there is no matched termination at the second and third connection points of the 3dB coupler. . . " (*Fütterer*, Column 4, Lines 38-40). Third, there are no inherent "method steps" described in *Fütterer*.

The Examiner stated that "The reference [Fütterer] does not specifically disclose inductances provided only to offset stray capacitances." (February 21, 2003 Office Action, Page 2). The Applicant agrees that *Fütterer* does not disclose inductances that are capable of offsetting stray capacitances in the manner disclosed and claimed by the Applicant.

The Examiner's position appears to be that, in view of *Fütterer*, "it would have been obvious for one of ordinary skill in the art to have recognized that the balanced inductances required would have to take into effect the stray capacitances and include these in the total capacitive component to have operation at a particular frequency for the oscillator as desired." (February 21, 2003 Office Action, Page 3). The Applicant respectfully traverses this position of the Examiner.

With respect to the rejection of Claims 1–2, 7–9, 14–20 and 18-20 as being obvious in view of *Fütterer*, it is well settled that the ultimate determination of obviousness is a legal conclusion that rests on factual determinations as required by 35 U.S.C. § 103. *Kimberly Clark v. Johnson & Johnson*, 745 F.2d 1437, 223 U.S.P.Q. 603 (Fed. Cir. 1984). In determining obviousness under § 103, one must (I) determine the scope and content of the prior art; (ii) ascertain the differences between the prior art and the claimed invention; and (iii) resolve the level of ordinary skill in the pertinent art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 U.S.P.Q. 459, 467 (1966); *Atlas Powder Co. v. E.I. Du Pont de Nemours & Co.*, 750 F.2d 1569, 1574, 224 U.S.P.Q. 412, 411 (Fed. Cir. 1984); *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050, 5 U.S.P.Q.2d 1434, 1438 (Fed. Cir.), *cert. denied*, 109 S.Ct. 75 (1988). The scope of the prior art is defined as that "reasonably pertinent to the particular problem with which the inventor was involved." *Stratoflex v. Aeroquip Corp.*, 713 F.2d 1530, 218 U.S.P.Q. 871 (Fed. Cir. 1983). Secondary considerations are also relevant to the obviousness inquiry and, when present, must always be considered in a determination of obviousness under 35 U.S.C. § 103. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 450, 230 U.S.P.Q. 416, 420-421 (Fed.Cir. 1986) *cert. denied*, 108 S.Ct. 85 (1987). The secondary considerations include commercial success of the invention, long felt but unsolved needs in the industry and failed attempts by others to invent the invention. *Bausch & Lomb, Inc.* at 420-421, citing, *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 895-896, 221 U.S.P.Q. 669, 674-676 (Fed. Cir. 1984), *cert. denied*, 105 S. Ct. 187

(1984). The secondary considerations may establish that an invention, apparently obvious in light of the prior art, is not obvious in fact.

The Applicant respectfully submits that the Applicant's apparatus and method for providing a noise resistant, low phase noise, frequency tracking oscillator, is not obvious in view of *Fütterer*. The Applicant respectfully directs the Examiner's attention to a very important fact that provides evidence of an essential secondary consideration in this case. The filing date of the *Fütterer* patent application is February 2, 1984. The filing date of the Applicant's patent application is March 8, 2001. The Applicant notes that difference in these two dates represents a time period that exceeds seventeen (17) years. This fact provides evidence that the Applicant's invention has provided a long felt but unsolved need in the industry. Seventeen (17) years is a very long time in the fast moving, innovative electronics industry of the modern age. It is clear that others have not invented the Applicant's invention during this long period of time. Therefore, the Applicant respectfully submits that there is a compelling secondary consideration that establishes that the Applicant's invention is not obvious in fact.

However, in addition to the existence of the compelling secondary consideration described above, the Applicant further notes that it would not have been obvious for one of ordinary skill in the art to have created the Applicant's invention from the teaching of the *Fütterer* reference. The unique and novel elements of the Applicant's invention are not disclosed, suggested, or even hinted at by the *Fütterer* reference.

A careful reading of the *Fütterer* reference discloses no mention of any circuitry designed to tune out stray capacitances within a SAW device. The required teaching or suggestion to make the Applicant's invention (and the required reasonable expectation of success for the Applicant's invention) is not found in the prior art. That is, the teaching or suggestion to tune out stray capacitances within a SAW device is found in the Applicant's disclosure. The Patent Office has not legally established a *prima facie* case of obviousness with respect to the Applicant's invention.

Therefore, the rejection of claims 1–2, 7–9, 14–20 and 18-20 under 35 U.S.C. § 103(a) has been overcome.

### 3. Provisional Double Patenting

The Examiner provisionally rejected Claims 1-2 and 7-9 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1, 8, 15-16 and 18-20 of copending United States Patent Application Serial No. 09/801,411. (February 21, 2003 Office Action, Page 3, Paragraphs 3 and 4). The rejection was a provisional rejection because the allegedly conflicting claims have not yet been patented. The Applicant respectfully traverses this rejection.

In Paragraph 3 of the February 21, 2003 Office Action, the Examiner described a Terminal Disclaimer as a means for overcoming a rejection based on non-statutory double patenting grounds. The Applicant appreciates this instruction by the Examiner, but believes that a Terminal Disclaimer

is not warranted in this case. Both applications were filed on March 8, 2001. Therefore, neither application has a life longer than March 8, 2021.

In Paragraph 4 of the February 21, 2003 Office Action, the Examiner stated that "Although the conflicting claims are not identical, they are not patentably distinct from each other because [t]he claims presented in this application ('451) are merely narrower in scope with regards to a two port SAW resonator circuit for providing low phase noise. The two port resonator is recited as a two port differential mode SAW resonator, ... with at least one inductance ... and at least one variable tuning capacitance. The use of a differential SAW resonator is notoriously well known in the art and allows for balanced design advantages." The Applicant respectfully traverses this rejection.

The two port differential SAW resonator of the present invention provides a circuit that is capable of performing a specific function that was not claimed for the two port SAW resonator of copending United States Patent Application Serial No. 09/801,411. The two port differential SAW resonator of the present invention is able to operate in conjunction with a differential amplifier to form a differential amplifier that provides common mode rejection. The Applicant respectfully submits that the two port differential SAW resonator of the present invention is patentably distinct with respect to the two port SAW resonator of copending United States Patent Application Serial No. 09/801,411.

4. **Allowable Subject Matter**

The Examiner has objected to Claims 3-6, 10-11 and 17 as being dependent upon a rejected base claim. Claims 3-6, 10-11 and 17 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (February 21, 2003 Office Action, Page 4, Paragraph 5). The Applicant agrees that Claims 3-6, 10-11 and 17 contain patentable subject matter. For the reasons set forth above, the Applicant respectfully submits that the rejected base claims (Claims 1, 8 and 15) are patentable and that there is no need to rewrite Claims 3-6, 10-11 and 17 in independent form.

Therefore, the Applicant respectfully requests that Claims 1-20 be passed to allowance.

The Applicant's attorney made the amendments herein as well as the arguments set forth above to place this Application in condition for allowance. In the alternative, the Applicant's attorney is making the same to properly frame the issues for appeal. In amending this Application, the Applicant makes no admission concerning any now moot rejection or objection, and affirmatively denies any statement or averment by the Examiner that was not specifically addressed herein.

## SUMMARY

If any issues arise, or if the Examiner has any suggestions for expediting allowance of this Application, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at ***wmunck@davismunck.com***.

A fee has been concurrently submitted for a one (1) month extension of time. No additional fees are believed to be necessary. However, in the event that any additional fees are required for the prosecution of this application, please charge any necessary fees to Deposit Account No. 50-0208.

Respectfully submitted,

DAVIS MUNCK, P.C.

Date: June 23, 2003

William A. Munck
Registration No. 39,308

P.O. Drawer 800889
Dallas, Texas 75380
(972) 628-3600 (main number)
(972) 628-3616 (fax)
E-mail: *wmunck@davismunck.com*